

REMARKS

The above amendments and these remarks are in response to the Office Action dated December 1, 2004. Claims 1-52 were pending in the application prior to the outstanding Office Action. In the Office Action, the Examiner rejected claims 1-52. No claims are currently being canceled, amended or added. Reconsideration of the outstanding rejections is requested.

I. Request for Consideration of Previously Submitted IDSs

1. Applicants mailed an IDS to the USPTO on **October 8, 2002**, but have not yet received an initialed copy of the IDS back, indicating consideration of the reference therein by the Examiner. Accordingly, Applicants are submitting a date stamped copy of this IDS, evidencing its receipt by the USPTO. Applicants respectfully request that the Examiner consider the reference cited therein and return to Applicants an initialed copy of this IDS. Applicants note that they had resubmitted a copy of this IDS on January 6, 2004, and thus that this is the second time Applicants are resubmitting a copy of this IDS.

2. Applicants mailed an IDS to the USPTO on **September 13, 2004**, but have not yet received an initialed copy of the IDS back, indicating consideration of the reference therein by the Examiner. Accordingly, Applicants are submitting a date stamped copy of this IDS, evidencing its receipt by the USPTO. Applicants respectfully request that the Examiner consider the reference cited therein and return to Applicants an initialed copy of this IDS.

3. Applicants submitted an electronic IDS on **September 13, 2004**, but have not received an initialed copy of the IDS back, indicating consideration of the references therein by the Examiner. Accordingly, Applicants are submitting a copy of the electronic IDS and an Acknowledgement Receipt from the USPTO, evidencing its receipt by the USPTO. Applicants respectfully request that the Examiner consider the references cited therein and return to Applicants an initialed copy of this IDS.

4. Applicants submitted an electronic IDS on **November 19, 2004**, but have not received an initialed copy of the IDS back, indicating consideration of the references therein by the Examiner. Accordingly, Applicants are submitting a copy of the electronic IDS and an Acknowledgement Receipt from the USPTO, evidencing its receipt by the USPTO. Applicants respectfully request that the Examiner consider the references cited therein and return to Applicants an initialed copy of this IDS.

II. Discussion of Rejections under 35 U.S.C. 103(a)

Claims 1-52 were again rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over *Lee* (U.S. Patent No. 4,789,801); and as allegedly being unpatentable over *Sakakibara et al.* (U.S. Patent No. 4,643,745).

In Sections 4 and 5 of the Office Action, the Examiner admitted that neither Lee nor Sakakibar teach a hollow second electrode with a leading nose and two side walls **with ends to the side walls bent back to substantially meet each other**. However, it was again asserted in the Office Action that "it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that specific configurations of the electrodes would have been an obvious matter of design choice." Additionally, it was also again asserted in the Office Action that since the second solid electrodes in Lee and Sakakibar are also collector electrodes, they would work equally well whether they are solid or having an annular space in the center ... because the collector electrodes collect ion particles on the surface." It was again further asserted that "specific configurations of the electrodes would have been determined by routine experimentation in order to achieve maximal benefits attendant therewith."

III. Examiner Interview

Applicant would like to thank Examiner Thao Tran and the Examiner's supervisor James Sedleck for the telephonic interview the took place on January 27, 2005. Applicant was represented by Jeffrey Kurin (41,132) and Sheldon Meyer (27,660) during the interview.

During the interview Applicant's representatives explained how the claimed invention came about, the advantages of the present invention, and the differences between the claimed invention and the prior art cited in the Office Action. Applicant's representative also explained why they believe that the claimed invention would not have been obvious to one of ordinary skill in the art, at the time the invention was made. Applicant's representative also explained the advantages of a hollow second electrode over a solid second electrode, and the advantage of the claimed hollow second electrode over previously developed and commercialized hollow second electrodes.

The Examiner and the Examiner's supervisor appeared to appreciate certain advantages of the claimed invention. Additionally, they agreed that if the present rejections are to be

maintained, the Examiner must provide more sufficient motivation for modifying the prior art in such a way as to produce the claimed invention.

IV. Brief Summary of the Claimed Invention

(and how it was developed; and advantages of the claimed invention)

U.S. Patent 4,789,801 to Lee (hereafter referred to as "Lee") discloses ion generators that are similar to the ones being presently claimed. More specifically, referring to FIGS. 1, 2 and 3 of Lee, the ion generators are shown as including minisectional electrodes (14', 50' or 60'), maxisectional electrodes (16', 52' and 58') and an exciting circuit 12 electrically coupled to the minisectional electrodes and the maxisectional electrodes in order, when energized, to create a flow of air in a downstream direction from the minisectional electrodes to the maxisectional electrodes. In the FIG. 3 embodiment, the maxisectional electrodes are elongated to increase the collection area for electrostatic precipitation, as explained at column 6, lines 5-7 of Lee. As can be appreciated from the FIGS. and as explained in the text, the maxisectional electrodes of Lee have a greater cross sectional area than the minisectional electrodes. This is believed to be because the minisectional electrodes are intended to act as ionization electrodes and the maxisectional electrodes are intended to act as collector electrodes (and thus preferably do not have features with small radiiuses or sharp surfaces that face the minisectional electrodes). As can also be appreciated from the FIGS. of Lee, each of the maxisectional electrodes are solid.

In the late 1990's, Applicant began developing an ion generator that was similar to the type disclosed in the Lee patent. In fact, the Assignee of the present invention eventually licensed the Lee patent. The initial commercial embodiment developed in part by the Applicant incorporated some features of the Lee patent, but also incorporated certain modifications. One of the modifications was the use of open ended hollow "U" shaped second electrodes of the type shown in FIGS. 4A and 4B of the present application, rather than the solid type shown in Lee. The hollow second electrodes are less expensive to produce than solid electrodes having the same outer dimensions (i.e., the same height, thickness, and depth). Further, a hollow second electrode will weigh less than a solid electrode having the same dimensions. A lighter second electrode results in an overall lighter system (which is easier to maneuver and less expensive to ship), as well as making the second electrode easier to remove (for those embodiments, where the second electrode is removable from the housing, e.g., as in claims 21-23 and 26-33).

Applicant eventually discovered certain disadvantages of the hollow "U" shaped second electrodes of the type shown in FIGS. 4A and 4B of the present application. The hollow "U" shaped second electrodes 242 includes a nose 246 and two sidewalls 244 that extended in a downstream direction, with a gap formed between the sidewalls 244, and exposed downstream edges. As explained in paragraph [0097] of the present application, the exposed downstream edges of the sidewalls 244 may be sharp, and the gap between the sidewalls 244 caused unwanted eddy currents to be generated, which created a "backdraft," or airflow traveling in a direction opposite than the desired direction of airflow.

In order to overcome these disadvantages of the hollow "U" shaped second electrodes of the type shown in FIGS. 4A and 4B, Applicant developed the claimed hollow second electrode, which is somewhat more complex and more difficult to make than the simple "U" shaped electrode shown in FIGS. 4A and 4B, but results in certain advantages. More specifically, Applicant developed a hollow second electrode that has "**a leading nose and two side walls with ends to the side walls bent back to substantially meet each other**," as shown, for example, in FIG. 5B of the present application (FIG. 5B is a cross section). Most commercial ion generators presently being sold by the Assignee of the present application include the hollow second electrodes of the type being claimed herein (i.e., with ends to the side walls bent back to substantially meet each other).

v. The Examiner has again failed to Establish a *Prima Facie* Case of Obviousness

Applicant again respectfully asserts that the Examiner has failed to establish a *prima facie* case of obviousness. As explained in MPEP 2143.03, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art."

The Examiner has repeatedly admitted that the applied prior art references do not teach two side walls "with ends to the side walls bent back to substantially meet each other." Nevertheless, without providing sufficient support or rationale, the Examiner has asserted that "it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that specific configurations of the electrodes would have been an obvious matter of design

choice" and that "specific configurations of the electrodes would have been determined by routine experimentation in order to achieve maximal benefits attendant therewith."

Most inventions are improvements over prior art inventions. Simply asserting something is obvious because one of ordinary skill in the art would know to experiment to try to obtain maximal benefits is not sufficient to establish a *prima facie* case of obviousness.

Applicant respectfully asserts that the claimed configurations of the electrodes would **not** have been determined by routine experimentation in order to achieve maximal benefits attendant therewith. As explained in MPEP Section 2144.05.II.B., which discusses *In re Antonie*, a **particular parameter must first be recognizable as a result-effective variable (i.e., a variable which achieves a recognized result) before determination of the optimum variable can be characterized as routine experimentation.** 559 F.2d 618, 195 USPQ 6 (CCPA 1977). In the present case, the cited prior art does not even suggest using a hollow collector electrode. Further, the cited art does not suggest what features of a hollow collector electrode could be adjusted in order to reduce eddy currents and/or to make the collector electrode easier and safer to clean. Further, the prior art does not even suggest that eddy currents may be a problem, or that easy and safe cleaning is desirable. Accordingly, there is nothing in the cited prior art that would motivate one of ordinary skill in the art to experiment with different hollow collector electrode shapes. Further, there is nothing in the cited prior art that would motivate one of ordinary skill in the art to attempt to overcome the problems that the present Applicant had discovered and effectively overcome.

Applicant also respectfully disagrees that the claimed configuration of the hollow second electrode would have been an obvious matter of design choice. The Examiner has cited no case law or MPEP section that states that the Examiner's general assertion is sufficient to establish a *prima facie* case of obviousness. Further, the Examiner has not pointed to any suggestion or motivation in the prior art to produce the claimed invention.

As pointed out by the Federal Circuit in *In re Fritch*, "**The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.**" 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992). If the Examiner is to maintain this rejection, Applicant respectfully requests that the Examiner point out where the prior art suggests providing a hollow

second electrode that is "formed to have a leading nose and two side walls with ends to the side walls bent back to substantially meet each other."

As mentioned above, the Examiner has also stated that the solid electrodes in Lee and Sakakibara would work equally well whether they are solid or have an annular space in the center ... because the collector electrodes collect ion particles on the surface. Whether or not this is true, Applicant does not see how this is relevant to patentability of the claimed invention. Nevertheless, as pointed above, and in all of Applicant's previous Replies to Office Actions, there are many advantages of the present invention over Lee and Sakakibara.

The prior art cited by the Examiner does not teach or suggest making a lighter and/or less expensive collector electrode. Thus, there is no motivation in the prior art cited by the Examiner to even make a hollow collector electrode in the manner claimed, i.e., "formed to have a leading nose and two side walls with ends to the side walls bent back to substantially meet each other."

Further, even if the cited prior art did suggest making a lighter and/or less expensive collector electrode (which the cited prior art does not), the cited prior art certainly does not teach or suggest making the claimed hollow second electrode that has "a leading nose and two side walls with ends to the side walls bent back to substantially meet each other." As mentioned above, one possible hollow collector electrode configuration is the simple "U" shaped electrode shown in FIGS. 4A and 4B of the present application. However, as also explained above, Applicant discovered that this type of electrode may produce unwanted eddy currents and sharp edges. To overcome these disadvantages, Applicant developed the claimed hollow second electrode, which is more complex and more difficult to make than the simple "U" shaped electrode shown in FIGS. 4A and 4B. Applicant believes that an electrode that is more complex and more difficult to produce is **not** a mere design choice. Rather, Applicant believes that the claimed hollow second electrode that has "a leading nose and two side walls with ends to the side walls bent back to substantially meet each other" is a significant patentable improvement in the art.

In summary, Applicant believes that the Examiner did not establish a *prima facie* case of obviousness. Further, even if the Examiner did establish a *prima facie* case (which she respectfully has not), for at least the reasons discussed above, Applicant believes that a *prima facie* case has been overcome.

VI. Brief Discussion of Remaining Claims

Claims 2-8, 18, 21, 24, 26, 29, 32 and 35 depend from and add additional features to independent claim 1. Applicant asserts that these claims are patentable for at least the reasons discussed above with regards to claim 1, as well as the features that they add. For example:

Claim 3 specifically requires that "the side walls have outer surfaces, and **the outer surfaces of each of the side walls are bent back adjacent to the ends of the side walls so that the outer surfaces of the side walls are adjacent to each other.**"

Claim 4 specifically requires that "the side walls have outer surfaces, and **the outer surfaces of each of the side walls are bent back adjacent to the ends of the side walls so that the outer surfaces of the side walls face each other.**"

Claim 5 specifically requires that "the side walls have outer surfaces, and **the outer surfaces of each of the side walls are bent back adjacent to the ends of the side walls so that the outer surfaces of the side walls touch to each other.**"

There is nothing in the cited references that teach or suggest any of these features (i.e., the features of claims 3, 4 and 5). Further, there is nothing in the cited prior art that would motivate one of ordinary skill in the art to try to produce an electrode that includes these features. Accordingly, for reasons similar to those discussed above with regards to claim 1, Applicant respectfully asserts that the Examiner has failed to establish a *prima facie* case of obviousness with regards to the dependent claims.

Independent **claim 9** includes the feature "wherein said hollow second electrode is formed to have two side walls with **ends to the side walls bent back to substantially meet each other in order to form a smooth trailing edge on said second electrode.**" For at least the reasons discussed above with regards to claim 1 and its dependent claims, Applicant asserts that claim 9, and its dependent claims 10-16, 19, 22, 25, 27, 30, 33 and 36, are also patentable over the applied reference.

Independent **claim 17** includes the features "wherein said hollow second electrode is formed to have two side walls with **ends to the side walls bent back to substantially meet the other side wall in order to form a smooth trailing edge on said second electrode.**" Claims 20, 23, 28, 31, 34 and 37-44 depend from and add additional features to independent claim 17. Applicants assert that these claims are patentable for at least the reasons discussed above with regards to claim 1 and its dependent claims.

Independent claim 45 includes the features "a hollow second electrode, located downstream of said first electrode, having a nose and two trailing sides extending downstream, towards said outlet, from said nose; said trailing sides include an end section that is formed inward, back towards said nose, such that substantially no gap exists between said trailing sides." Claims 46-50 depend from and add additional features to independent claim 45. Applicants assert that claims 45-50 are patentable for similar reasons to those discussed above discussed above with regards to claim 1 and its dependent claims.

Independent claim 51 includes the features "a hollow second electrode, located downstream of said first electrode, having a nose and two trailing sides extending downstream, towards said outlet, from said nose; said trailing sides include an end section that is formed by bending said trailing sides inward and back towards said nose, such that said end sections are adjacent to each other and within said trailing sides of said second electrode." Claim 52 depends from and adds additional features to independent claim 51. Applicants assert that claims 51 and 52 are patentable for similar reasons discussed above with regards to claim 1 and its dependent claims.

VII. Conclusion

In light of the above, it is respectfully requested that all outstanding rejections be reconsidered and withdrawn. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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